DOCUMENT RESUME

ED 277 514 RC 016 042

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TITLE Distance Education in Rural Areas.
PUB DATE Apr 86
NOTE 46p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Access to Education; Adult Education; Audiotape Cassettes; Communications Satellites; Developing Nations; *Distance Education; *Educational Technology; Libraries; Nontraditional Education; *Political Influences; *Program Descriptions; Radio; *Rural Areas; *Socioeconomic Influences; Telephone Instruction; Videodisks; Videotex

ABSTRACT

This discussion of social and political aspects, advantages and disadvantages of distance education programs includes descriptions and examples of delivery technologies and programs in developing and developed countries. Among the social aspects considered are distance education's potential to provide a second chance to people who are trapped by geographic isolation, poor school performance, economic disadvantagement, old age, discrimination, and health problems. Political aspects of distance education include ability to reach the majority who are excluded from education in developing countries and to reverse irrelevant, discriminating, colonial models of education. Critics contend that distance education tends to isolate students and defuse student power traditional in on-campus settings, preserve apartheid in South Africa, foster cultural imperialism, undercut local autonomy and individual instructor control, reduce diversity and pluralism in favor of centralized production and homogenization, become a propaganda tool, and make students into passive recipients of overly structured packets of knowledge. Issues in the development of distance education include equal access via government subsidization/direction versus market-driven development, communication systems inadequacies, teaching strategies appropriate to technologically-dependent learning, and enhanced student-teacher interaction. Delivery technologies described are satellites, videotex, teletext, audiocassettes, telephone, radio, television, videocassette/videodisc, and libraries. (LFL)

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RC016042

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ROME, NEW YORK
APRIL 1986

ABSTRACT OF DISTANCE EDUCATION IN RURAL AREAS

"Distance Education in Rural Areas" provides information about distance education programs in both economically developing nations as well as in developed countries. The social effects of distance education, both negative as well as positive, are discussed.

The paper covers the questions of government subsidization as opposed to a laissez-faire approach and the subject of equal access in distance education. The importance of student interaction as opposed to the passive consumption of distance education is discussed. An example of some of the problems encountered by students is also provided.

Delivery technologies are described and examples of programs that employ these specific forms of technology as their primary delivery mode are discussed. Their advantages and disadvantages are noted. These delivery modes are audio cassettes, libraries, radio, satellites, telephone (including Cyclops), teletext, television, video cassettes, video discs, and vidotex.

Distance education has the capability of providing access, and of removing previously insurmountable barriers, to an education that was denied to the elderly, the poor, minorities, and millions of third world people. Geographically isolated rural residents, military personnel, prison inmates, house wives who find it difficult to attend traditional college courses because of young children, workers whose jobs require them to work different shifts or to live in remote areas would often for the first time have the option of continuing their education.

Distance education has the potential of providing a second chance to people who feel trapped, who believe that their fate was sealed during their adolescence by previous school performance or by the lack of accessibility to college because of a plethora of geographic, economic and social factors. Indeed, just knowing that the option of a second chance exists would be a tremendously liberating ray of hope to many people who believe that their hopes and chances are over and their fate sealed. For these people distance education would almost be seen as an act of liberation or accessibility to hope.

Eastern Montana College uses distance education to provide courses in a vast geographic area in Montana. A large segment of the population is chronically unemployed with a significant American Indian population living in rural isolation on reservations.

> "Eastern Montana College has developed a teleconferencing system over a two year period to experiment with distant learning technology suitable in a low density/large area environment. In the first year of a two year grant, the college expanded this system with a four-wire Educational Telecommunications System to serve the small rural communities of eastern

Montana and the seven Indian reservations."[1]

The Eastern Montana program opens the door to an opportunity that could not possibly exist without the availability of distance education.

San Diego State University offers television courses to the elderly in a program called the Televised Educational Growth Opportunities project (TEGO). A survey determined that at least forty percent of the elderly in San Diego County had access to cable television. A local public televison station broadcasts to at least two thousand enrolled elderly students per term. Participants are involved by interactive participation with instructors or student aids by live telephone calls.[2]

As the average population in the United States continues an upward ascent, programs that provide intellectual stimulation for the elderly are essential. Without programs like TEGO the elderly are often isolated and unable to attend courses because geographic factors are often exacerbated by the lack of adequate public transportation in the United States. Furthermore, because of the expense involved in traditional courses many elderly people are excluded for that reason alone.

TEGO doesn't offer career courses since most elderly people are not training for careers. TEGO's interactive medium allows it's students a chance to become less passive and to offer information about their extensive life experiences. The elderly

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[1]U. S. Department of Education, Office of Educational Research and Improvement. Resources for Change: A Guide to Projects, 1980-1981, p. 28.

[2]Ibid., p. 77.

have a lot of accumulated wisdom to offer in interacting with higher education. Without distance education programs such as TEGO the alternative for many is a life of isolation and intellectual stagnation.

Distance education makes life long learning a reality for many adults. It emphasizes the point that ones education shouldn't be over when a person graduates from high school or college.

It is hoped that distance education will have dramatic effects in the third world. In economically developing countries education is not only regarded as a basic human right but also as a very important element in the social, political, and economic development of a country.[3]

In developing countries distance education must seek to reach the fifty percent, or more, of the people who are virtually excluded from an education. Distance education in economically developed countries strives to enable a much smaller percent of the population, approximately five percent, to attain higher education.[4]

In developed nations the thrust is mainly towards the individual development of an excluded minority. In developing nations the emphasis is that distance education should have an impact upon the economic and social development of those nations.

In many third world countries the old colonial model of

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[3]Richard M. C. Siaciwena, "Continuing Education in Zambia," Media in Education and Development, 16:4 (December 1983) p. 165.

[4]Michael J. Mcrory, review of The Lion and the Clockwork Mouse, by Michael Young, in Media in Education and Development, 15:1 (March 1982) p. 53.

education not only failed to reach the vast numbers of people who needed an education, it often provided the wrong type of education. That is, the colonial model of education perpetuated social inequality, it had an alienating quality about it, and its curriculum was often irrelevant to the needs of the populace.[5]

After Kenya gained independence in 1963 it determined that universal primary education was vitally essential for development. Only one third of potential primary students were in school, and even minimally trained teachers were almost nonexistant for such a large number of students. Kenya recruited large numbers of untrained people, eighty-two percent of which had no education beyond the primary level, to fill the gap. It was impossible for traditional colleges to train, and expensive beyond the means of Kenya, anywhere near the numbers of teachers to meet the needs of the nation.[6]

A University of Wisconsin team spent four years in Kenya studying the educational problems of the nation and helping to institute correspondence courses backed by radio lessons. They helped Kenyan colleagues write radio scripts and correspondence courses, and to set up administrative support systems. A United States Agency for International Development (AID) grant along with a grant from Denmark helped to fund the project.

The success of the Kenya Radio Correspondence Project is

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[5]Ibid., p. 53.

[6]United States Department of State, Agency for International Development, Radio Correspondence Education in Kenya, AID Project Impact Evaluation Report No. 37, (1982). p.3

demonstrated by the fact that "an overwhelming majority of the 12,000 teachers trained through this method passed national examinations and qualified for promotions to higher salaries."[7]

Teachers were motivated to take the course by an automatic promotion upon passing examinations. This resulted in Kenya's education budget being strained to such a degree that it had to abandon the promotion policy causing enrollments to plummet. Kenya abandoned the project but it has since set up other distance education projects to not only train teachers, but farmers, health workers, and craftsmen as well. The need is even greater now with a population growth rate that will double Kenya's population by the year 2000.[8]

The 1982 AID study of the Kenyan program concluded that "if sufficiently subscribed, radio correspondence instruction can provide quality education on a par with traditional school systems at significant cost savings."[9] The report also stated that distance education in Kenya required adequate broadcasting and postal services, field organization and user motivation.

Kenya's success and experience with radio correspondence teaching has attracted the attention of many Third World nations. The Kenya model is seen as a answer to the need of training secondary and primary teachers in adequate numbers without the great expense of building and staffing teaching colleges.[10]

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[7]Ibid., p. VII.

[8]Ibid., p. 4.

[9]Ibid., p. IX.

[10]Ibid., p. 4.

The African Association of Correspondence Education was founded mainly because of the Kenya model. Its members reflect the concern that Third World nations have in regards to the importance of distance education as being able to positively effectuate social economic change in their countries. Members are Algeria, Egypt, Nigeria, Tunisia, Ghana, Liberia, Sierra Leone, Tanzania, Zambia, Malawi, Togo, Botswana, Lesotho, Uganda, Swaziland, Ethiopia and Sudan.[11]

Not all assessments of distance education are totally positive. One should say, to be more specific, that the way distance education is directed in certain situations can have negative aspects to it. These criticisms range from distance education not promoting equal access by using methods to make it only available to the wealthy to the use of distance education to disseminate propaganda.

Besides reaching out to isolated, remote students, some critics contend that in some instances distance education programs are initiated for the specific purpose of keeping students isolated. This would serve as a depoliticizing function to defuse student power in a traditional on-campus setting. Some critics of the Shah in pre revolutionary Iran felt that the Free University of Iran was established to perform just such a function.

In a similar situation critics of the distance teaching University of South Africa contend that it is an instrument of apartheid since its instruction method is ideally suited towards

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[11]Ibid., p. 90.

that end.

At the University of Antioquia in Columbia a distance education project was opposed because it was felt that it would lead to the depoliticization of the student body by having less on-campus students.[12]

In the case where distance education systems operate on a multi-national basis as is the case with the University of the South Pacific there is the concern of cultural imperialism. The University of the South Pacific uses a satellite network to reach Micronesian, Melanesian, and Polynesian students in eleven island states. English is used as the language of instruction in an area where many languages are spoken.[13]

With increasingly sophisticated, complex delivery media and programs there is a concern over the loss of local antonomy, or individual instructor control for that matter. Since economy of scale necessitates a very large production run to lower costs, one centrally produced, standardized version of a particular program or software would be more economically advantageous.[14]

As centralization of production increases with distance education there is a trend towards a homogenization of the

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[12] Greville Rumble. The Contribution of Distance Education in Providing Education for a Just Social Order (Bethesda, Maryland: ERIC Document Reproduction Service, E D 237 073, 1983), p. 7.

[13] Ibid., p. 9.

[14] Christopher Dede. "Educational, Social and Ethical Implications of Technological Innovation," Programmed Learning and Educational Technology 18:4 (November 1981), p. 206.

product. This could reduce diversity and pluralism. "If economic factors are too major a determinant of the quality of instructional content, a 'lowest common denominator' effect on programming may occur, with a resultant loss in worldwide human potential."[15]

Since distance education tends to be more of a centralized product it is more susceptible to becoming a propaganda tool, especially in a closed society. This is especially the case if students are unable to meet together or question the information that they receive.[16]

Distance learners are sometimes portrayed as passive recipients of overly structured packets of knowledge. The distance teacher could be like a disc jockey, isolated from the outside world, playing his pre-selected recordings without any direct feedback from his clients whatsoever.[17] Of course, the goal today is to have feedback and interaction as much as possible. Passive consumption is one of the least desirable goals of an effective distance education program.

If distance education programs were implemented with the express purpose of providing equal access to all were guaranteed, it would require government subsidization and direction. This would result in a greater integration of the poor, minorities, the disabled, elderly and rural people into society. On the other hand a totally laissez-faire approach could result in just the opposite. That is, companies engaged in the manufacture

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[15]Ibid., p. 208.

[16]Rumble, The Contribution of Distance Education in Providing Education for a Just Social Order, p. 8.

[17]Ibid., p. 6.

and distribution of this educational technology would seek the market that offered them the greatest financial rewards. Distance education would be directed at the middle and upper middle classes and professionals. Thus distance education could very well be just another resource separating the classes all the further.[18]

Put another way, distance education could turn out to be another exotic resource available to Yuppies or it could be a liberating tool to promote a more egalitarian society. Much is dependent upon the social policy chosen. It could serve to enhance human potential or to further limit it.

As to what direction distance educaion takes I think that the names of two institutions in particular say a lot. In Britain it is the Open University and in Israel it is Everyman's University. Perhaps, to be more fair, it should be Everybodies University.

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[18]Dede, "Educational, Social and Ethical Implications of Technological Innovation," p. 211.

DELIVERY TECHNOLOGY AND PROGRAMS

I have listed technologies and described programs that primarily use a specific delivery mode as separate entities. The reason I listed tham as separate entities is for convenience. In reality the distinctions between technologies are becoming increasingly blurred. For example, videotex uses a television and telephone lines. Telephone conversations or teleconferencing for that matter may be relayed by satellite instead of by terrestrial lines.

Another example of the distinction between technologies becoming blurred is a device called Cyclops. Cyclops gives the telephone tutorial an electronic blackboard using a TV set and a light pen which allows tutors or students to write on a TV screen. It employs television, telephone lines, audio cassettes, and computers. Its message may be sent via satellite and it can handle videotex.

SATELLITES

Todays communication satellites function as relay stations that can relay many different types of signals. These signals on the ground would be transmitted via local cable or broadcast systems, by telephone lines or by microwaves. Satellites can relay radio or television signals and computer related signals.

One satellite located above the equator can relay signals to approximately one third of the earths surface. All that is required to reach ninety percent of the earths surface is three satellites at intervals of 8,000 miles above the equator.[1] I like to think of satellites as functioning like mirrors that are capable of reflecting signals back to earth because of their superior vantage points.

INTELSAT I, the United States first operational communications satellite went into operation in 1965 and cost four million dollars. It had a designed life span of only eighteen months and could relay one TV channel or 240 circuits.

INTELSAT V went operational in 1981 at a cost of thirty four million dollars. It had an operational life of eighty-four months while INTELSAT I was only expected to work for eighteen months. INTELSAT V can handle 12,000 simultaneous two way telephone circuits and two color TV channels. "A half-circuit is a two way communication path suitable for voice exchange between one earth station and a satellite. When it is matched with a corresponding half-circuit between the satellite and another earth station, a through two-way voice circuit or full circuit is provided."[2]

It is predicted that by the 1990s communication satellites will have up to 50,000 communication circuits and an operational life span of more than

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[1]Kenneth A. Polcyn, "The Role of Communication Satellites in Education and Training: the 1990s," Programmed Learning and Technology Review, 18:4 (November 1981), p. 231.

[2]Ibid.

fifteen years.

The more powerful a sattelite's transmitting power the less has to be spent on expensive ground reception stations. The point-to-point system was necessary because satellites had a relatively low powered transmitter that sent weak signals. This system required an antenna which stretched about 85 feet across and used approximately three million dollars worth of amplification equipment. The newer systems for direct home broadcast uses strong transmitting power from the satellite, most of this power is solar generated. Transmissions will be received on an antenna only ten feet across.[3]

It is predicted that in the near future you will need antennas only the size of a dinner plate costing in the area of $500.00 each to receive satellite transmissions.[4]

Just looking at these two factors indicates just how cost effective satellites have become. First of all, the expense of establishing a multitude of ground broadcast stations is eliminated by satellites which have a vast coverage. Secondly, with more powerful satellites, ground receptions costs are being reduced dramatically. Widely dispersed individuals and organizations can simultaneously share satellite services. As the use of communications satellites continues to increase costs have continued to decrease.

The Applachian Community Services Network (ACSN) delivers, via satellite, sixty-four hours a week of self-help, educational, and general informational programs to primarily rural subscribers throughout the U.S. Undergraduate and graduate courses for college credit and professional development seminars along with community service programming is offered. ACSN has "talk back" on some programs using ground telephone lines for interaction.[5]

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[3]Charles E. Feasley, Serving Learners at a Distance: A guide to Program Practices, (Washington: Association for the Study of Higher Education [1983]), p. 19.

[4]Polcyn, "The Role of Communication Satellites," p. 236.

[5]Ibid., p. 239

Alaska shares RCA SATCOM satellites with commercial users to deliver educational and public service programming to Alaskan communities. The system is also used for teleconferencing by health centers and schools and is being expanded to most communities with 25 or more people.[6]

The American Educational Television Network (AETN) is the nations first public pay TV network providing adult education programs. Much of AETN's programming is aimed at in service training for professional associations and employee organizations so that they can meet license requirements. These include engineers, lawyers, dentists, pharmacists and other professionals. AETN believes that tremendous growth potential exists in this area. Multimedia productions are created in their California studios, using leading professionals in the various fields, and sent via satellite throughout the United States.[7]

Canada has a domestic communication satellite network that uses a portion of its capability for continuing education. India also plans to have a similar system in which remote communities will receive direct broadcast TV. India also plans to have two-way audio in place. Japan, Australia, Colombia, Saudi Arabia, Argentina, France and Brazil are to launch satellites in the 1980s that are to have some educational and training programs scheduled.[8]

China plans to launch a synchronous communications satellite to improve radio and television transmission with its attendant cost savings. They hope to get a World Bank loan to launch the satellite which will be positioned above the equator. The programming will be for distance education through the TV University in China.[9]

In the 1990s international and national university use of communication

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[6] Ibid.

[7] Ibid.

[8] Ibid., p. 240.

[9] Kai, N. Yeh, "The TV University in China," Media in Education and Development 16:4, (December 1983), p. 161.

satellites will allow small off campus learning centers to provide a full range of services now only found on main campuses. They will also allow the access of data bases and libraries from remote locations as well as providing access to noted scholars. With declining enrollments universities will move into continuing education markets serving professionals who will not have to travel to inconvenient locations at major campuses.[10]

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[10] Polcyn, "The Role of Communication Satellites," p. 242.

VIDEOTEX

Videotex is a new technology in which a user can access a data base from his home using a telephone line with a modem. The retrieved information is then displayed in color on a TV screen in either text or graph form. Through the use of a menu a user can access a vast amount of data that may be displayed in page form. Videotex frames may also be stored for later use to save on telephone and computer charges. Hard copy can be obtained by using a microcomputer printer. A very nice feature of videotex is that it is interactive. The user has control over what information he wishes to see by manipulating a hand held selector.

Software packages could be created that would allow home computers to be used as videotex receivers. In fact a company by the name of Avcor sells a software package for one hundred dollars that fits the Commodore home computer.[11]

Videotex is not the best delivery system to use for detailed descriptions that may be better provided by ordinary text. One of its strongpoints is its ability to provide corrected and continually updated information at the behest of the user. Currently some videotex systems provide consumer services such as banking, job information and home shopping.

The first operational videotex system, also called viewdata system, is the British Telecom system by the name of Prestel. Most uses of Prestel are commercial and business in orientation.

The Council for Educational Technology in Britain has conducted studies on how videotex can be applied to education and training. One example would be for a group of meterological students to interpret a weather map and predict as to how a weather pattern would develop during the day. New metero-

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[11] Philip A. Rubin. A Primer on Electronic Text Technology for College Administrators. (Bethesda, Md.: ERIC Document Reproduction Service, ED 259 721, 1984), p.6.

logical information, updated every three hours would be supplied by Prestel to test their predictions. Videotex can give a sense of reality and immediacy to meterological instruction.[12]

Prestel could have a cost effective value, and a time-saving value as well, to libraries. Libraries wouldn't need to subscribe to expensive annual directories when they could access them with videotex.[13]

Another use that the Council for Educational Technology has for Prestel is the automatic distribution of computer programs by Prestel videotex.

> "In the space of a few minutes a teacher or student can browse through details of a library of programs, decide to obtain one, and bring it down and store it on a disc, ready to run as required on the local microcomputer. Program suppliers no longer need to supply new discs or cassettes for every program, save on postage and packing, and, instead of invoicing each purchaser directly, can recover their charge for the program through Prestel's automatic billing mechanism."[14]

This is a new technology that is quite expensive to use. Business and commercial use will have to be more extensive before it is more widely used in education.

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[12]Vincent Thompson, "Videotex in Education," Media in Education and Development, 15:3, (September 1982), p. 118.

[13]Ibid., p. 119.

[14]Ibid.

TELETEXT

Teletex delivers electronic text to a television set that has a teletex decoder either attached to it or built into it.

Pages of text are sent out with the broadcast television signal but do not interfere with regular programming. The text to be transmitted is usually stored in a minicomputer which has custom software for teletext transmission. A cycle of pages is sent in a numerical order. Viewers have to wait for the specific frames to be sent in order to view them. The individual frames may then be stored in the adaptor to be displayed with or without the video picture that comprises broadcast television.[15]

Teletex was originally developed by the British for the hearing impaired. The captioned text is synchronized with the video program and this function of teletext is currently one of its major uses. Teletex could serve to make broadcast television distance education courses accessible to the hearing impaired which constitutes approximately eight percent of the population.[16] I have not, however, read of teletext being used to reach the hearing impaired with distance education programs.

The Ceefax and Oracle teletext systems in Britain, the Antiope system in France, the TextTV system in Sweden all basically offer similar commercial services. These teletext systems transmit stock exchange information, weather data, sports and consumer information, agricultural data, and programming information.

Unlike videotex, teletext is not at all interactive. With videotex a user can control what information he or she seeks to access. With teletext the user only receives what is transmitted. With videotex a user cannot only

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[15]Roger Woolfe, "Videotex and Teletex: Similarities, Differences and Prospects," Programmed Learning and Educational Technology, 18:4, (November 1981), p. 247.

[16]Ibid.

receive the information, he can act upon it. For example, "checking hotel facilities, then making a reservation; inspecting a bank balance, then authorizing a transfer; reading a product test, then placing a purchase order."[17]

Basically there are two types of teletext systems based upon the British and French models. These two systems are not compatible and standardization is a problem.

Because of the lack of interaction capabilities "it is unlikely that teletext will be of great use to distance learning systems."[18]

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[17] Ibid., p. 252.

[18] Tony Bates, "Trends in the Use of Audio-Visual Media in Distance Education Systems," in Distance Education: International Perspectives, ed. Sewart D. Keegan, (London: Croom Helm, 1983), p. 236.

AUDIO CASSETTES

Audio cassettes have proven themselves to be an invaluable tool in distance education. Despite the fact that the humble audio cassette player is not nearly as exciting as satellites, or other exotic delivery media, it is extremely successful in some programs. Indeed, it is partly because of the fact that is is common, and relatively inexpensive, that it is used so successfully.

Tutors can maintain a human touch and a communicative rapport with their students. Audio cassettes are conducive to individual pacing, they may be played over and over again at convenient times, dependent upon the needs of individual students which is impossible with broadcast distance education programs.[19]

Academics involved in distance education feel that they have a greater control over production and use and can integrate cassettes more easily into course design. Audio cassettes can be individually oriented in that the lessons may be altered for individual students.

A comment that students frequently make is that using an audio cassette distance lesson is much like having a personal lesson with the courses author in ones own room.[20]

> "Audio cassettes allow for mastery learning, explanation, and of graphical, tabular, and printed conceptual material, practice in problem solving, and exercises in mathematical processes. Audio cassettes can be used for providing resource material, such as discussions, interviews, case study material, language use, for analysis by students, and for step-by-step analysis and discussions by the unit author."[21]

For economically developing countries there is the problem of a shortage of available cassette machines in student homes and the problem of distributing cassettes.

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[19] Feasley, Serving Learners at a Distance, p. 31.

[20] Bates, "Trends in the us of Audio-Visual Media," p. 234.

[21] Ibid., p. 239.

Britain's Open University has increasingly found that broadcast time allocated to distance education is a scarce commodity to come by. The British Broadcasting Corporation (BBC) which broadcasts Open University programs now allocates less radio time and relegates TV programming slots to before breakfast and after midnight. The Open University now offers more courses which further makes the air time situation all the more difficult.[22]

The Open University has found that audio cassettes are an ideal alternative. Indeed, on courses with small enrollments they have found that it is cheaper to mail cassettes than to broadcast radio programs. Furthermore, there are the many advantages previously listed.

An example of some advantages of audio cassettes is shown in an Open University geology course. The audio cassette is used to direct students, step-by-step, through text material, filmstrips, and even to thin-section rock specimens under an Open University supplied microscope. Students can easily replay the cassette whenever they have a problem, as many times as they need to.[23]

At the University of Waterloo in Ontario, Canada, audio cassettes are used in teaching distance education language courses to geographically dispersed students.

Thirty-three courses in nine languages are offered in the Waterloo Correspondence Program. Courses are offered in Dutch, Greek, Latin, Polish, Russian, Scientific German, Spanish, Ukrainian, and business French.

A course package consists of course notes, prescribed textbooks, assignment lists, and an album of twenty audio cassette lectures.[24]

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[22] J. H. Horlock, "A University Without Walls," Media in Education and Development, 17:2 (June 1984), p. 54.

[23] Ibid.

[24] Robert Karpiak, "Language Teaching through Distance Education: Some Approaches to Two-way Communication," Canadian Journal of University Continuing Education, 11:2 (October 1985), p. 22.

Audio cassettes are used to initially provide autobiographical information about both the professors and students. This allows for a more personal relationship between the tutor and individual class members and helps to mitigate the feeling of loneliness among students. They can also give students information about class size and other class information to let students know that there are others struggling along in the same boat.[25]

The Massey University Center for University Extramural Studies relies on correspondence and audio cassettes in courses leading to seven undergraduate degrees and fifteen diplomas, most of which are post graduate. Mid-career studies for occupations such as nursing, business, social work, teaching, etc., are offered to professionals who would find it extremely difficult to attend a traditional college.

The New Zealand Technical Correspondence Institute, which has an enrollment of 35,000 students, also makes extensive use of audio cassettes. Most of these courses lead to vocational certificates.

The Continuing Education Unit of Radio New Zealand gives public interest broadcasts on such subjects as Pacific culture and cancer to name two. Audio cassettes of these broadcasts are made available to public libraries.[26]

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[25] Ibid., p. 25.

[26] United Nations Educational, Scientific and Cultural Organization. Distance Learning for Teacher Education. Report of a Technical Working Group Meeting, (Bethesda, Md.: ERIC Document Reproduction Service, ED 240 989, 1982), p.11.

TELEPHONE

Telephone teaching enables distance education institutions to offer a greater diversity of courses to widely dispersed, isolated students. It is often the only relatively economical means of providing interactive instruction to students who cannot attend a traditional institution of higher learning. Teleconferencing has enabled widely dispersed groups of students to participate interactively, not only with the tutor, but with other groups of remote students in a class like situation.

Telephone enrichment courses which allow students to speak with famous scientists, authors, musicians, political figures, and others have proven to be very successful.[27]

Despite the many advantages of telephone teaching there are problem areas. Telephone line quality problems are evident in many countries, especially in rural areas. Line quality problems have been corrected by distance education systems installing their own conference bridging equipment and renting what are known as dedicated lines.[28]

As I understand it, dedicated lines are devoted specifically to the organization that rents them. However, this solution would only help in the case of telephone learning centers, and would not be possible for home learners.

In some countries, like Norway for example, telephone teaching is prohibitively expensive for long distance calls. In order to facilitate dialogue between students and their teachers some countries use voucher systems which entitle the students to a specified number of long distance calls.[29] These calls are more of a supportive nature. They are to clear up problems, or to

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[27] Feasley, Serving Learners at a Distance, p. 29.

[28] Bates, "Trends in the use of Audio-Visual Media," p. 234.

[29] Michael Law and Linda Sissons, "The Challenge of Distance Education," New Directions for Continuing Education, 26 (June 1985), p. 51.

develop a relationship between the tutor and students, then regularly scheduled tutorial calls.

For students who live some distance from Iowa City, and are unable to commute, the University of Iowa offers the Telebridge System. The Telebridge System allows the University to "bridge" the distance to any location in Iowa with telephone lines and thereby create a statewide classroom.

An amplified telephone system with speakers and microphones allows for live communication between students and instructors. Texts, audiovisual materials, and handouts complement the telephone teaching. Courses in social work, education, business administration, film, religion, nursing, and others are offered. For a course to be presented a minimum of seven students are needed at each Telebridge class site. University of Iowa broadcast television courses also make use of the telephone in that campus based instructors are available by toll-free phone.[30]

The University of Wisconsin uses the telephone for distance education in much the same manner as the University of Iowa. The University of Wisconsin's Educational Telephone Network has reached up to 210 class meeting places with dedicated four-wire telephone lines, loudspeakers, and microphones complemented with text material. A survey of student participants found that 88 percent would take another course taught in the same manner.[31]

"Teletutorial" field trials at the University of Waterloo in Canada reportedly have also had a good student response. First year German students in groups of eight to ten students located in geographically dispersed locations participated.

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[30]National Association of State Approved Colleges and Universities. Directory of U.S. Traditional and Alternative Colleges and Universities. (Washington, D.C.: National Association of State Approved Colleges and Universities, 1983), p. 359.

[31]Feasley, Serving Learners at a Distance, p. 28.

> "Prior to the teleconference, students were supplied with all necessary information and an agenda which included a general question period followed by German pronunciation drills, textbook-based oral exercises, and finally a conversation."[32]

Students found that the teleconferences were good for spontaneous interactive oral practice. Audio cassette recordings of each teleconference were mailed to the participating students so that the teleconferences could be studied at their convenience.

Athabasca University in Calgary, Canada, also uses telephone tutorials as an integral part of its distance education foreign language instruction.[33]

The fact that telephone teaching is interactive is very important. However, the lack of a visual form of presentation is a limiting factor.

An extremely exciting development that seeks to address the problem of giving visual capability to telephone instruction is being experimented with and developed in Britain.

Cyclops gives telephone teaching, and audio cassette teaching as well, visual capabilities. Cyclops also gives the tutors and students an electronic blackboard on which they may write with an electronic light pen on a standard television screen.

Cyclops uses a microprocessor which interfaces with a standard audio cassette player. This is connected by a modem to the telephone network whose lines are used for transmission.

A light pen is provided for the user to write on the screen with. The written messages are then sent over telephone lines (using a modem hook up). Each user at opposite ends of the telephone line can see what is being written by the other person. They can then change or alter all or part of the picture

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[32]Karpiak, "Language Teaching through Distance Education," p. 28.

[33]Ibid., p. 27.

with their light pen. An example of its use would be that a student could write a mathematical equation and the tutor could correct that equation from another location. Cyclops can also work as a videotex terminal with the addition of a keyboard.[34]

The creation of color pictures is done at a Cyclops studio where a relatively inexperienced user can "input a photograph via the television camera and, modity it as necessary, create a graph, create a frame of text, with various colors, size and character sets to be superimposed on the previous pictures."[35]

Cyclops has several advantages over microcomputers. A user doesn't have to be a skilled programmer, or skilled with sophisticated software. Cyclops also provides sound which is synchronized with the video presentation.

Cyclops, obviously, with all its sophisticated equipment would require a tremendous capital investment. The Open University in Britain has found tremendous merit in Cyclops. They have not, however, been able to initiate it in other areas beyond the East Midlands region in Britain.[36]

In Southeast Asia twelve universities are planning to initiate the Cyclops system. These twelve universities will then be able to have Cyclops visual teleconferencing via satellite.[37]

One professor at a campus could have a class that could be seen and heard at all twelve campuses. It would also be an interactive class as well, one in which the students could ask questions.[38]

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[34]Robin Williamson, "The Cyclops Audio Graphic System," Media in Education and Development, 16:2 (June 1983), p. 64.

[35]Ibid.

[36]Tony Bates, "Cyclops: An Overview," Media in Education and Development, 16:2 (June 1983), p. 73.

[37]Williamson, "Cyclops," p. 65.

[38]Ibid.

At the University of Illinois the Engineering Continuing Education office also uses an electronic blackboard. It too employs telephone lines for transmission.[39]

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[39] Feasley, Serving Learners at a Distance, p. 27.

RADIO

Radio has the ability to reach mass audiences due to the fact that there is such a large degree of radio ownership.

Many Third World countries initially instituted distance education radio broadcasting programs as a means of training teachers. Nigeria's distance education program is typical. It sought to address the problem of there not being enough trained teachers to provide universal primary and secondary education for Nigeria. Today Nigeria's University of the Air offers other study areas besides education, as do many other Third World Nations.[40]

A problem is that broadcast radio cannot always reach its target audience. In Tanzania it can only be received by forty-five percent of the population.[41] Unfortunately the number of radios in the Third World is not always sufficient to meet the needs of these countries. Radio broadcasts cannot provide a visual image nor are they interactive. Also a lack of study centers makes many radio programs less successful.

The Institute of Adult Studies at the University of Nairobi in Kenya accompanies radio instruction with the marking of lessons, giving examinations and distributing course material. Surprisingly, the radio lessons are not required listening. "Radio tutorials sought to replace the usual function of a classroom teacher in encouraging and sustaining the interest of slower less-motivated students, clarifying lessons, and answering questions."[42] Many students in the Nairobi program complete their lessons prior to the airing of the program but listen anyways for reinforcement.

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[40]F.Z. Gana, "Distance Education: A Nigerian Perspective," Educational Media International 4:1 (January 1985), p. 12.

[41]Bates, "Trends in the use of Audio-Visual Media," p. 229.

[42]U.S. Department of State, Agency for the International Development, Radio Correspondence Education in Denya, AID Project Impact Evaluation Report No. 37 (1982), p. 3.

The personal experiences of Mr. Kariuki, an unqualified Kenyan primary school teacher who took distance education radio courses to upgrade himself makes interesting reading. It also reveals some of the problems that students and Third World distance education programs face.

> "Mr. Kariuki enrolled with the Correspondence Course Unit (CCU) the first year that courses were offered, signing up for English, math, and geography. He found the lessons somewhat difficult, but was helped by the radio discussions of each lesson that were broadcast from Nairobi, despite transmissions that were often weak or interrupted by electrical storms, a year later he passed a qualifying exam and was automatically promoted to the lowest level of qualified teacher. Mr. Kariuki was impressed with the high qualify of the correspondence lessons and their prompt correction and return by mail. In 1974, he passed an examination roughly equivalent to four years of high school and was promoted to his present P2 status. Mr. Kariuki again enrolled for CCU courses in 1979 to prepare for an examination that would qualify him for further promotion. Months elapsed and he did not receive the course materials. He checked with the CCU several times. Eventually, some course materials arrived, but the essential textbooks, guidelines, and many lessons are still missing. Lessons submitted in May had not been returned by November. Mr. Kariuki became disillusioned with CCU and stopped tuition payments."[43]

The Open University in Britain has used broadcast radio in its distance education programs. Initially they broadcast a small number of courses to a large number of students. This meant that they did not need as much air time as they would need now that they have a much greater diversity of courses offered.

The Open University now broadcasts at unpopular times such as after midnight. They also have discovered that in courses with a small enrollment it is cheaper to mail audio cassettes than to broadcast programs.[44] Since many courses at the Open University have less than five hundred students, this seems a logical solution. The Open University still uses twenty-four hours a week of radio broadcast time.[45]

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[43] Ibid., p. 2.

[44] Horlock, "University Without Walls," p. 54.

[45] Bates, "Trends in the use of Audio-Visual Media," p. 229.

In the United States radio broadcast instruction is minimal. National Public Radio (NPR) was created by the Corporation for Public Broadcasting along with National Education Radio, which was an organization of up to two hundred university and college radio systems. NPR adopted the preference of National Education Radio in having cultural programming instead of educational programming. Forty percent of NPR stations broadcast radio education programming in 1978. In 1982 only twenty nine percent offered educational programming.[46]

An interesting research project involves what is known as a VHF header code. This code is arranged in such a manner so that it only switches on designated machines that are to receive a specific transmission. In effect it is a radio electronic mailbox. Only those students who need a specific broadcast would receive it.[47]

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[46]Feasley, Serving Learners at a Distance, p. 32.

[47]Horlock, "University Without Walls," p. 55.

It is reported that in 1978-79 fourteen percent of 2,800 colleges and universities surveyed used television to some degree in off campus instruction.[48]

Despite these figures an International Institute of Educational Planning study done in 1980 showed a movement away from television broadcasting. The survey of twelve distance learning institutions showed a movement away from television broadcasting. The survey of twelve distance learning institutions in different countries found that while nine used TV broadcasting, only one, The Open University in Britain, used it more than ten hours a week.[49]

There are several reasons as to why distance education organizations are using less broadcast time. One reason is that in many countries distance education institutions do not always have full cooperation with broadcasting organizations. There is sometimes a perceived lack of control over what is to be produced, as well as just how it is to be produced. Broadcast time is hard to come by and very expensive when there is often a small class enrolled for each course.[50] This causes the per student expense of television broadcast courses to rise to such a degree that they are not cost effective and therefore not practical.

Academic distrust of audio-visual media is a factor. Teachers see the distributional advantages of television broadcasting but not the educational advantages.[51]

A report entitled "Serving the Rural Adult: Inventory of Model Programs in Rural Adult Post-secondary Education" states that the least used media is television. This report covered rural United States distance programs.[52]

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[48]Feasley, Serving Learners at a Distance, p. 16.

[49]Bates, "Trends in the use of Audio-Visual Media," p. 229.

[50]Ibid.

[51]Ibid., p. 230.

[52]Bruce O. Barker, "Understanding Rural Adult Leraners: Characteristics and Challenges, Lifelong Learning, 9:2 (October 1985), p. 6.

Cable television is almost nonexistent in rural areas due to the cost of wire installation. Memorial University in St. John's Newfoundland uses cable to reach the non-campus student population in St. John's. For areas outside of St. Johns, however, they use video cassettes.[53]

Having written about how broadcast television is used less frequently, it is interesting to see how China uses television for education. The Peoples Republic of China is in the process of developing the largest distance education system in the world. It is a system that will rely heavily on broadcast television.

China, with a staggering total student population of 230 million, can send no more than six percent to traditional institutions of higher education.[54] Clearly, the needs of China far exceed the capabilities of traditional higher education.

The Central Radio and Television University (CRTU) "is a central production organization with the responsibility for the design of curricula, creation of courses, setting examinations and minimum attainment standards, production of telecasts, and the writing and design of supporting print materials.[55]

The twenty-eight province or city based Television Universities (TVUs) broadcast CRTU material or their own courses based upon local needs. TVUs determine which students are to be admitted and competition for admission is intense.

Full time TVU students are paid during their three years periods of study by sponsoring organizations. They return to those organizations upon graduation.

China is a land where there is limited private ownership of television sets. It is the students sponsoring organization, often an employer such as

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[53]Bates, "Trends in the use of Audio-Visual Media," p. 232.

[54]Yeh, "TV University in China," p. 157.

[55]Ibid., p. 158.

a factory, who provides the television sets, viewing facilities, and study areas. It is reported that the Beijing TVU alone has more than six hundred study centers.[56]

By decree CRTU graduates are declared equal to regular college graduates which means that they will receive the same wages. Courses of study are in areas such as electronic and mechanical engineering, chemistry, mathematics, and English, which is extremely popular.

The television distance education courses do not appear to be presented in the most colorful, stimulating manner. Most lectures involve a lecturer speaking and writing on a blackboard with one camera focused on him for fifty minutes.

This fifty minute lesson approach "dictated the use of far too much written text on the screen. It is not that the technicians lack the skills and capability. Rather it is the studios which lack the sophistication of additional elements such as good graphics and the means to display them."[57]

China plans to dramatically improve its TVUs and plans to rely heavily on them for meeting its future educational needs. It plans to replace microwave relay stations with satellite based systems and to introduce more color television sets. CRTU hopes to improve the quality of its presentations and to create a less rigid system with a greater diversity of course offerings.[58]

In the United States the University of Iowa offers television courses for the renewal of teacher certificates, for career improvement, degree attainment, or for personal satisfaction. The University provides a good deal of support to ensure the successful completion of courses. Student information guides to help students study at home, study guides, instructors who are avail-

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[56]Ibid., p. 159.

[57]Ibid., p. 160.

[58]Ibid., p. 161.

able by toll-free phone, texts and other written material and learning centers are provided. Learning centers are located at convenient locations throughout the state (within fifty miles of every location in Iowa). Students review TV programs, take exams, and receive counseling and assistance at the learning centers.[59]

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[59] National Association of State Approved Colleges and Universities, Directory, p. 359.

VIDEO CASSETTE and VIDEODISC

Video cassettes provide all the advantages of audio cassettes plus a visual dimension as well. Like the audio cassette the video tape may be stopped and replayed to cover material that has to be reviewed again. This is an improvement over a television broadcast that must be viewed at a broadcast time that is frequently inconvenient.

Stanford University installed an education television system in 1968 to train engineers at their places of employment in California's Silicon Valley. When companies started moving beyond the forty mile limit of Stanford's microwave broadcast system they initiated the use of video cassettes and small group teaching with in-plant tutors supplied by the companies. This type of tutored video instruction has been successfully used by Stanford for over ten years.[60]

This small group approach not only has the educational advantages of providing a tutor and groups of students to discuss the lesson and provide reinforcement, it reduces cost. Even in the most wealthy nations, video cassette machine ownership is limited due to cost, even though costs continue to decrease.

Videodiscs are a further technological improvement over the video tape method of providing a visual recording. The life span of these discs is relatively infinite when compared to the video tapes which deteriorate. The tapes deteriorate especially just when used for still frames, and when repeatedly used for fast searching or in slow motion. This is often the case in a learning situation where specific material must be replayed and stressed.[61]

Videodiscs may be searched very quickly, in a matter of seconds, to display a specific frame while with video tape it takes considerably longer. This is because of the fact that with video tape the user must search through the

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[60]Patricia Fleetwood-Walker, "Distance learning through tutored video instruction," Media in Education and Development 18:2 (June 1985), p. 76.

[61]H. G. Plummer, "Teacher Training and Interactive Videodisc Technology," Programmed Learning and Educational Technology 22:3 (August 1985), p. 246.

whole tape in sequence.[62]

Interactive videodisc represents another advancement. Basically what it does is to combine the advantages of the computer with the visual advantages of videodisc technology. The equipment used is a videodisc player with its own microprocessor, either added on or built in, which is hooked to a microcomputer and an appropriate software package.

Interactive video is very responsive to individual needs. The user responds to questions within the program that direct him to different levels of complexity. The student can be tested at various points in the learning program, and the student can move on or be redirected back to cover previous material for reinforcement. With interactive videodisc a student who understands most of the material in a lesson would not have to cover that material again, he could move on to the segment that is necessary for his individual needs.

Interactive videodisc users would also have the options in a lesson of doing a more extensive study of a subject or of simply giving the material a cursory glance. This is again based upon the individual needs and desires of the students.

Information that is in the computer program for the lesson may also be altered at any time to update the lesson.[63]

Besides having the computer based advantages there also are the video advantages. These would include pictures of a quality for superior to computer generated pictures. Also included would be sound effects, music, maps, documentary films and so on. They could be combined with computer generated graphics and text.[64]

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[62] Ibid.

[63] Eric Parsloe, "Interactive Video," Media in Education and Development 16:2 (June 1983), p. 83.

[64] Ibid., p. 84.

With videodisc there is the option of using two separate soundtracks. One could be in German, for example, and the other in Greek. Or the same video could be aimed at nurses and doctors with different audio material directed to each group.

Different manufacturers have developed different standards for video disc equipment. These differences hinder the acceptance and development of interactive videodisc for more extensive use. The industry is currently making some attempts at standardization.[65]

The Open University finds that while it is far too expensive as of yet for their use in distance education it is an "extremely effective teaching medium."[66]

Business is using interactive videodisc to some degree as of 1983. American Express uses it for management training in Europe and General Motors Corporation uses it in many countries.[67]

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[65] Ibid., p. 86

[66] Horlock, "University Without Walls," p. 55.

[67] Parsloe, "Interactive Video," p. 86.

LIBRARIES

Unfortunately most rural libraries are woefully ill equipped. There is generally a lack of services and books and almost no emphasis in the area of adult education.[68]

If a greater commitment to distance education for rural adults existed, along with the necessary funding, rural libraries could serve as a valuable aide to distance education.

Libraries could serve as learning centers and provide reference material as well, relating to courses. They could be like a modern bookstore and provide not only printed educational material but computer software, audio cassettes and video tapes in educational areas.

In Harrisburg, Pennsylvania, Clarion State College has an off-campus program for graduate library science students. Material is provided by the college to the Pennsylvania State Library and to the Dauphin County Public Library for use in this program.[69]

Macquarie University in Australia considers student access to an "adequate library service" as a requirement in order to be enrolled in various external degree programs.

In Macquarie University's external law degree program, students use court house libraries amongst others.

> "Adequate library facilities consisting of the basic English, Australian Commonwealth and New South Wales Law Reports, Commonwealth and New South Wales Statutes, and basic practice texts must be available near the applicants place of residence or work. Such facilities must be close enough to enable a student to spend several evenings there each week. Arrangements have been made for students to use the library facilities of the Australian National University Law School in Canberra, the University of Newcastle,

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[68] Barker, "Rural Adult Learners," p. 6.

[69] Gerard B. McCabe. Library Services for the Distant Learner, the Clarion State College Libraries Experience, (Bethesda, Md.: ERIC Documents Reproduction Service, ED 232 684, 1984), p. 1.

the University of New England in Armidale, the Mitchell College of Advance Education in Bathhurst and the Riverina College of Advanced Education in Wagga Wagga. The Department of Justice has agreed to let students use the court house libraries throughout the State, and arrangements have been made with solicitors in country areas for students to use their private collections."[70]

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[70] Macquaire University Calendar for 1985. (Maryborough, Victoria, Australia: Hedges and Ball, 1984), p. 114.

CONCLUSION

The continuing cost reductions in microcomputers have made home ownership of computers a possibility for many people in more wealthy nations. Microcomputers can access vast amounts of information from distant data bases through telephone lines. Software discs can be mailed to students for use in their own computers.

One problem with computers used in this manner, however, is the lack of compatibility between different computer systems. This is being reduced through the increase of software that is IBM compatible.

With all this attention being centered on various forms of delivery media I have ignored the most important form of delivery medium. It is the printed word that accounts for the greatest amount of instruction.

> "Books and other printed texts have great advantages over electronic media; they are portable, need no power supply, contain very large amounts of information within a compact format, lend themselves to 'random-access' treatment and to easy cross-reference. They can be delivered relatively cheaply to any part of the United Kingdom, and the skill required to use them is possessed by almost every member of the adult population."[71]

It must be extremely difficult for a distance education student, struggling along, alone and unsupported as he tries to decipher a difficult lesson. In a worst case scenario I can visualize a garbled transmission, fleetingly crackling over the late night airwaves as a student, tired from working all day, tries to understand an unimaginative, poorly done lesson. It would require a student with a tremendous degree of self-direction

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[71]Horlock, "University Without Walls," p. 53.

and confidence to triumph in such a situation.

It is a paradox that many distance education students when compared with traditional students are of a "higher age with comparatively less formal education with a likelihood of less literacy, less confidence. Yet distance education appears in theory to be more appropriately associated with high literacy and independence from support."[72]

It would seem that distance education courses would have to be of an even higher quality than traditional courses. This would be a total reversal from the idea that has prevailed for many years that correspondence education is of a second best quality.

Many distance education programs are moving above this second best reputation. They are relying less on the broadcast medium and tend to be more oriented towards a multimedia approach. New technologies are being developed that make distance education more convenient and allow for interaction between students and instructors. Unfortunately these delivery mediums are for the most part extremely expensive. It is hoped that as they are developed and become more widespread they will become more economically feasible. A goal to work for is to offer distance education programs that are not only of a high quality but are accessible as well

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[72]Law and Sissons, "The Challenge of Distance Education," p. 43.

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